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Ratio of basin lag times for runoff and sediment yield processes recorded in various environments

KAZIMIERZ BANASIK & AGNIESZKA HEJDUK
Warsaw University of Life Sciences – SGGW, Faculty of Civil and Environmental Engineering, 166 Nowoursynowska str., PL-02-787 Warsaw, Poland
kazimierz_banasik@sggw.pl

Abstract River basin lag time (LAG), defined as the elapsed time between the occurrence of the centroids of the effective rainfall intensity hyetograph and the storm runoff hydrograph, is an important factor in determining the time to peak and the peak value of the instantaneous unit hydrograph (IUH). In the procedure of predicting a sedimentgraph (suspended sediment load as a function of time), the equivalent parameter is the lag time for the sediment yield (LAG_s), which is defined as the elapsed time between the occurrence of the centroids of sediment production during a storm event and the observed sedimentgraph at the gauging station. Data of over 150 events recorded in 11 small river catchments (located in Poland, Germany, UK and USA) with a drainage area of 0.02 km^2 to 82 km^2 have been analysed to estimate the ratio of LAG_s/LAG. The ratio, in majority of cases was smaller than 1, and decreased with increase of river basin slope. Special attention is given to the data collected in a small agricultural catchment and also during snowmelt periods, which is located in central Poland.
Key words small catchment; soil erosion; suspended sediment; sediment graph; snowmelt event; IUSG